

Biagio Cassano

Curriculum Vitae

Current position

Jul 2019 - **Ricercatore (TD - Tipo A)**, *Fondo Sociale Europeo— Programma Operativo Nazionale Ricerca e Innovazione 2014–2020, progetto PON: progetto AIM1892920-attività 2, linea 2.1—CUP H95G18000150006 ATT2*,
Now Dipartimento di Matematica, Università degli Studi di Bari, Bari, Italia.

Education and previous positions

- Sep 2018 - **Post-doc**, *Nuclear Physics Institute of the Czech Academy of Sciences*, Řež
Jul 2019 (Prague), Czech Republic, in the research group of Pavel Exner and David Krejčířík.
- Mar 2018 - **Post-doc**, *Basque Center for Applied Mathematics*, Bilbao, Spain,
Jun 2018 INDAM fellowship "Mensilità di borse di studio per l'estero".
- Mar 2016 - **Post-doc**, *Basque Center for Applied Mathematics*, Bilbao, Spain, in the group
Feb 2018 "Linear and Non-Linear Waves" of Luis Vega.
- Feb 2015 - **Post-doc**, "Sapienza" – *Università di Roma*, in the group of Piero D'Ancona
Jan 2016 and Luca Fanelli.
- Nov 2011- **Ph.D.**, "Sapienza" – *Università di Roma*,
Dec 2014 Supervisor: Prof. Piero D'Ancona.
- Sep-Dec 2013 **Internship**, *BCAM - Basque Center for Applied Mathematics*, Bilbao, Spain.
Aug 2010 **Summer School**, *SMI - Scuola Matematica Interuniversitaria*, Perugia, Italy.
- 2009–2011 **Laurea magistrale in Matematica**, *Università degli Studi di Bari*, Italy,
(Orientamento Generale, classe LM-40), 110/110 cum Laude.
- 2005–2009 **Laurea in Matematica**, *Università degli Studi di Bari*, Italy, 110/110 cum
Laude.
- 2005 **Maturità scientifica**, *Liceo E. Fermi*, Bari, Italy, 100/100 cum Laude.

Ph.D. Thesis

Title *Spacetime asymptotics for Schrödinger Equations*
Date 19 Dicembre 2014
Institute "Sapienza" – Università di Roma
Supervisor Prof. Piero D'Ancona

Description Some results on scattering for a fully variable Schrödinger equation and for systems of weakly coupled Schrödinger equations are discussed. Also, we obtain results related to the Hardy Uncertainty Principle and Gaussian decay of solutions to the Schrödinger equation.

Master's Thesis

Title *Equazioni iperboliche lineari con coefficienti dipendenti dal tempo* (Linear Hyperbolic equations with time-dependent coefficients)

Date October 13, 2011

Supervisors Prof. Enrico Jannelli and Dr. Giovanni Tagliatalata

Bachelor's Thesis

Title *La soluzione fondamentale per l'equazione delle onde* (The fundamental solution for the wave equation)

Date December 10, 2009

Supervisor Prof. Enrico Jannelli and Dr. Sandra Lucente

Teaching

Ph.D. Courses:

2019-2020 Course "Self-adjointness for unbounded operators on Hilbert spaces: perturbation theory and self-adjoint extensions" for the Ph.D. School in Informatics and Mathematics at "Università degli Studi di Bari".

University Courses:

2020-2021 "Precorso", introductory course of the degree in "Matematica".

2020-2021 Part of the course "Analisi 1-2" for the degree in Matematica of "Università degli Studi di Bari".

2020-2021 Part of the course "Matematica" for the degree in Chimica e tecnologia farmaceutiche of "Università degli Studi di Bari".

2019-2020 Part of the course "Matematica" for the degree in Scienze Ambientali of "Università degli Studi di Bari".

2019-2020 Part of the course "Analisi Matematica" for the degree in Informatica e comunicazione digitale of "Università degli Studi di Bari".

2019-2020 Part of the course "Matematica" for the degree in Chimica e tecnologia farmaceutiche of "Università degli Studi di Bari".

2014 Assistant professor for "Mathematics 2" for the degree in "Economics" (in english language) at LUISS - Libera Università Internazionale degli Studi Sociali "Guido Carli" - Roma.

2012 Remedial course in Mathematics "OFA" (offerta formativa aggiuntiva) for first year students in Chimica at "Sapienza" – Università di Roma.

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Participation to national and international research groups

1. Participation to the research group “Dinamiche dispersive: Analisi di Fourier e metodi variazioni” (“FIRB 2012 Fanelli” RBFR12MXPO_002, responsabile locale Prof. Luca Fanelli), 03/2013 - 03/2016;
2. Participation to the research group “Harmonic Analysis and Differential Equations: New Challenges” (ERCEA - Advanced Grants 2014: 669689 - HADE, Prof. Luis Vega), 1/12/2015 - 30/11/2021;
3. Participation to the research group “Mathematical models for interacting dynamics on networks” (COST Action CA18232) in the Workgroup “Variational methods on graphs and networks”, Prof. Delio Mugnolo, 4/10/2019 - 03/10/2023;
4. Participation to the research group “Equazioni di tipo dispersivo: teoria e metodi” (GNAMPA-INDAM n. PRR-20200116-100143-292, responsabile scientifico Prof. Piero D’Ancona), starting 8/4/2020.

Publications

1. B.C., Luca Fanelli, *Sharp Hardy uncertainty principle and gaussian profiles of covariant Schrödinger evolutions*, Transactions of the American Mathematical Society 367, 3 (2015) 2213-2233, Publisher: American Mathematical Society, DOI: 10.1090/S0002-9947-2014-06383-6.
2. B.C., Mirko Tarulli, *H^1 -scattering for systems of N -defocusing weakly coupled NLS equations in low space dimensions*, Journal of Mathematical Analysis and Applications 430, 1 (2015) 528-548, Publisher: Academic Press Inc., DOI: 10.1016/j.jmaa.2015.05.008.
3. Andrea Braides, B.C., Adriana Garroni, David Sarrocco, *Quasi-static damage evolution and homogenization: A case study of non-commutability*, Annales de l’Institut Henri Poincaré (C) Non Linear Analysis 33, 2 (2016) 309-328, Publisher: Elsevier Masson SAS, DOI: 10.1016/j.anihpc.2014.10.003.
4. B.C., Piero D’Ancona, *Scattering in the energy space for the NLS with variable coefficients*, Mathematische Annalen 366, 1-2 (2016) 479-543, Publisher: Springer, DOI: 10.1007/s00208-015-1335-4.
5. B.C., Luca Fanelli, *Gaussian decay of Harmonic Oscillators and related models*, Journal of Mathematical Analysis and Applications 456, 1 (2017) 214-228, Publisher: Academic Press Inc., DOI: 10.1016/j.jmaa.2017.06.067.
6. B.C., Fabio Pizzichillo, *Self-Adjoint Extensions for the Dirac Operator with Coulomb-Type Spherically Symmetric Potentials*, Letters in Mathematical Physics, Volume 108, Issue 12, 1 December 2018, Pages 2635-2667, Publisher: Springer, DOI: 10.1007/s11005-018-1093-9.
7. B.C., Fabio Pizzichillo, *Boundary triples for the Dirac operator with Coulomb-type spherically symmetric perturbations*, Journal of Mathematical Physics, Volume 60, Issue 4, 1 April 2019, Article number 041502, Publisher: American Institute of Physics Inc., DOI: 10.1063/1.5063986.

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8. B.C., Fabio Pizzichillo, Luis Vega, *A Hardy-type inequality and some spectral characterizations for the Dirac-Coulomb operator*, *Revista Matemática Complutense* Volume 33, Issue 1, 1 January 2020. Publisher: Springer, DOI: 10.1007/s13163-019-00311-4.
9. B.C., Orif O. Ibrogimov, David Krejčířík, František Štampach, *Location of eigenvalues of non-self-adjoint discrete Dirac operators*, *Annales Henri Poincaré* volume 21, pages 2193–2217, 8 June 2020, Publisher: Springer, DOI: 10.1007/s00023-020-00916-2.
10. B.C., Vladimir Lotoreichik, *Self-adjoint extensions of the two-valley Dirac operator with discontinuous infinite mass boundary conditions*, *Operators and Matrices*, Volume 14, Number 3 (2020), 667–678.

Preprints

11. B.C., *Sharp exponential localization for solutions of the Perturbed Dirac Equation*, arXiv preprint arXiv:1803.00603 (2018), to appear in *Communications in Contemporary Mathematics*.

Conferences

In the organizing committee of:

- Dec 2019 **EDP e DINTORNI - V Meeting around PDE**, *Università degli Studi di Bari*.
- Apr 2014 **Analysis of Relativistic and Non-Relativistic Models in Quantum Mechanics**, “Sapienza” – *Università di Roma*.

I have presented the talks:

- Feb 2020 **Self-adjoint extensions of the two-valley Dirac operator with discontinuous infinite mass boundary conditions**, *Quantum Mechanics of Artificial Material Structure*, Sirius Mathematical Center, Sochi, Russia.
- Ott 2019 **Sharp rate of exponential decay for eigenfunctions of perturbed Dirac operators**, *Asymptotic Analysis & Spectral Theory*, Institut de Mathématique d’Orsay, Orsay, France.
- Sep 2019 **Self-adjoint extensions of the two-valley Dirac operator with discontinuous infinite mass boundary conditions**, *Analytic and algebraic methods in physics*, Czech Technical University, Prague, Czech Republic.
- Jul 2019 **Sharp rate of exponential decay for eigenfunctions of perturbed Dirac operators**, *Dirac-2019: Waves, Particles, Spectra*, Steklov Institute of Mathematics of the Russian Academy of Sciences, St. Petersburg, Russia.
- Mar 2019 **Self-adjointness and spectral properties for the Dirac operator with Coulomb-type perturbations**, *Differential operators on graphs and waveguides*, TU Graz, Austria.
- Dec 2018 **Sharp rate of exponential decay for eigenfunctions of perturbed Dirac operators**, *IV Meeting around PDE*, Università degli studi di Bari.
- Dec 2018 **Sharp rate of exponential decay for eigenfunctions of perturbed Dirac operators**, *Université de Franche-Comté, Besançon, France*.

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- May 2018 **Self-adjoint extensions for the Dirac operator with Coulomb-type spherically symmetric potentials**, Universidad de Valladolid, Valladolid, Spain.
- Feb 2018 **Self-adjointness for the Dirac operator with Coulomb-type potentials**, *Mathematical Challenges in Quantum Mechanics 2018*, “Sapienza” – Università di Roma.
- Dec 2017 **Self-adjointness for the Dirac operator with Coulomb-type potentials**, *Xmaths Workshop 2017*, Università di Bari.
- Sep 2017 **Gaussian decay for solutions to the electromagnetic Schrödinger equation and Hardy uncertainty principle**, *Cuarto Congreso de Jóvenes Investigadores*, Universitat de València, Valencia (Spain).
- Jun 2016 **Hardy uncertainty principle and gaussian decay for solutions to the Schrödinger equation**, BCAM - Basque Center for Applied Mathematics, Bilbao (Spain).
- Dec 2015 **Hardy uncertainty principle and gaussian decay for solutions to the Schrödinger equation**, *Xmaths Workshop 2015*, Università degli Studi di Bari.
- Mar 2015 **Scattering in the energy space for Schrödinger equations**, *Brainstorming on Hyperbolic Equations*, Università degli Studi di Bari.
- Ott 2015 **Scattering per l’equazione di Schrödinger**, Università degli Studi di Bari.
- Sep 2014 **Scattering in the energy space for the NLS with variable coefficients**, *Roman Summer School and Workshop on KAM Theory and Dispersive PDE’s*, “Sapienza” – Università di Roma - Argiletum, Università di Roma 3.

Visiting periods

- Nov 2019 Czech Technical University, Prague (Czech Republic), November 20 to 22.
- Sep 2019 Nuclear Physics Institute, Prague (Czech Republic), September 9 to 27.
- Dec 2018 Université de Franche-Comté, Besançon (France), December 10 to 14.
- Nov 2018 UVa - Universidad de Valladolid, Valladolid (Spain), November 6 to 9.
- May 2017 “Sapienza” – Università di Roma, May 2 to 5.

Awards & Grants

- 2015 “Menzione speciale” for the prize “Premio Tesi di Dottorato 2014” in “Sapienza” – Università di Roma.
- 2015-16 Research fund “Avvio alla ricerca - TIPOLOGIA A” of “Sapienza” – Università di Roma for the project “Proprietà delle equazioni di Schrödinger e Helmholtz”.
- 2014-15 Research fund “Avvio alla ricerca - TIPOLOGIA A” of “Sapienza” – Università di Roma for the project “Proprietà asintotiche per l’equazione di Schrödinger”.

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Review activity

I am referee for “Mathematical Methods in the Applied Sciences”, “Zeitschrift für angewandte Mathematik und Physik”, “Journal of Nonlinear Analysis”, “Revista Matemática Iberoamericana”, “Transactions of AMS”, “Mathematische Nachrichten”, “INDAM-Springer series”.

Computer skills

Good knowledge of \LaTeX
Basic knowledge of MATLAB

Languages

Italian **Mother tongue**
Spanish **Good**
English **Good**

Bari, 23/09/2020

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